

Table of Opportunities for Sustaining Natural Communities, by Ecological Landscape

Background

The purpose of this Ecological Opportunities table is to provide a quick way to determine the best places in the state (Ecological Landscapes) for sustaining different natural communities (Natural community types are described in the Appendix entitled “Natural Communities”). Part 1 of the table ranks the importance of each Ecological Landscape in maintaining or restoring the various natural community types. Part 2 lists the historic and current abundance of natural communities. Ecological opportunities for aquatic community types are not included here but will be published at a later time.

“Sustaining natural communities” means ensuring that a given natural community type will be present and has high potential to maintain its natural composition, structure, and ecological function over a long period of time (e.g., 100 years). Estimating the likely degree of sustainability required looking at each natural community type from a landscape perspective across the state or region to determine whether occurrences of communities are large enough and/or connected enough to support the composition, structure and ecological function of a community type over time. The goal of sustaining natural communities is to manage for natural community types that historically occurred in a given landscape.

This goal of sustainability does not preclude a “working landscape” where both traditional (e.g., forest and agricultural products) and non-traditional (e.g., ginseng, sphagnum moss, etc.) products are extracted from an area. People are dependent on natural resources, so to maintain economic sustainability over the long term, natural resources must be sustained. Such a philosophy allows for human use so long as the capacity of natural resources for self-renewal is not compromised. However, removing natural resources in an unsustainable way will not benefit natural communities, our economy, or the human population in the long term.

This table can help guide land and water management activities so that they are compatible with the local ecology of the Ecological Landscape and also maintain important components of ecological diversity and function. It should help to identify the most appropriate community types that could be considered for management activities within each Ecological Landscape. Therefore, this table is intended for broad land and water management applications. For example, this table should be useful for planning and management activities related to:

- working forests that provide timber and other goods and services;
- wildlife and fisheries areas, as well as state, county, and local parks designated for recreational pursuits;
- selection of natural areas established to protect both rare and representative natural communities; and
- assisting other conservation interests by providing an appropriate ecological context for their projects.

The information presented here can help focus management of natural communities on areas where the potential for success is greatest. It will not, however, answer questions regarding appropriate scale (how big), degree of connectivity, or how to create a desirable landscape pattern through these management efforts. Those more detailed steps require further analysis.

Some community types may need restoration because they have been greatly reduced in size or frequency of occurrence across part or all of their state range. Some communities have been greatly modified, resulting in a simplified or otherwise altered composition or structure, limiting the ecological functions that are necessary for sustainability. Restoration could include reestablishing species composition or vegetation structure. It could also include restoring a missing, diminished, or altered ecological process or influence, such as fire or water flow. Managers also need to consider landscape effects such as fragmentation of patches, reduction in patch size, change in the pattern of community types, and connectivity. Representation of all successional stages associated with a given community type is an important consideration to ensure that those elements of diversity most in need of attention are maintained somewhere across a regional landscape. For example, in many forest community types older successional stages are now rare or absent in much of Wisconsin and are especially important to consider when planning restoration projects. In a few cases, such as northern wet-mesic forest (i.e., white cedar swamp), young stands are virtually nonexistent outside of a few locations with special circumstances. Restoration opportunities will be discussed in greater detail in the individual Ecological Landscape chapters.

Data Sources for Table

Primary data sources for the table include the Natural Heritage Inventory (NHI) statewide database on natural communities, and selected state and regional summaries prepared by WDNR and other agencies and organizations. Other data sources used include: Forest Inventory and Analysis (FIA) data; Southern Forest, Savanna and Grassland Ecosystem research project; The Nature Conservancy's Ecoregional Planning initiative; presettlement vegetation data; the Chequamegon-Nicolet National Forest Landscape Analysis and Design (LAD) process; and the Northwest Pine Barrens study.

The purpose of the NHI data is to document occurrences of rare plant and animal species, and both rare and representative natural communities. Not all community types have received equivalent inventory attention. For widespread and common types, the focus has been on large, relatively undisturbed occurrences, or the older (and/or rarest) successional stages of many forest communities. For rare types such as mesic prairie and algific talus slope, we have tried to identify as many potentially viable examples as possible. Communities that have seldom been conservation priorities, such as alder thicket or shrub carr, have received less attention than other types. For types that have only recently been discovered or described in Wisconsin (e.g., alvar), data on distribution and abundance may be incomplete; it is difficult to assess their status at this time.

Description of Table

This table is presented in two parts. The first part of the table lists how important each Ecological Landscape is to maintaining or restoring natural community types. The second part of the table lists the historical and current abundance of natural communities.

The first part of the table is organized by ecological opportunities for sustaining natural communities by Ecological Landscape. The following four attributes are included in the table.

Inventory Confidence. The confidence placed in the knowledge of natural community types occurring within each Ecological Landscape (EL) is indicated by two categories. The first identifies those EL's that have not been well inventoried; for these areas additional data are needed. There is incomplete knowledge about what natural community types exist and their extent. The second category is used to indicate that there are sufficient data or knowledge about the presence of natural community types within an Ecological Landscape.

Ecological Opportunities. Opportunities for sustaining natural communities are listed as major, important, present, or absent. A major opportunity is defined as a community type that is represented by many significant occurrences within an Ecological Landscape, or that the EL is appropriate for major restoration activities (see individual EL chapters for restoration potential for community types). An important opportunity means that a community type is not extensive or common in an EL but has a minimum of one to several significant intact occurrences that should be considered for protection and/or management. Or it means that the natural community type is restricted to just one or a few ELs within the state and should be considered for management there because of limited geographic distribution and a lack of opportunities elsewhere. If a community type is listed as present it means that better management opportunities exist in other Ecological Landscapes or that management opportunities have not been adequately evaluated. A blank (absent) indicates that the community does not occur or has not been documented there.

The intent of this table is to provide a statewide perspective on the best places in the state to manage Wisconsin's natural communities. If a community type is found in an Ecological Landscape but is not listed as a major or important opportunity for management in the table, it does not mean that the community type should not be managed or preserved if there are important reasons for doing so locally.

Natural Communities. The natural communities presented in this table are mostly derived from the work of Curtis (1959), with additions and revisions by Epstein et al. (2000). The major headings (e.g., northern forest, southern forest, oak savanna, etc.) follow the natural communities presented in the Biodiversity Report (Addis et al., 1995). To simplify the table and make it more useable, some natural community types from the NHI list have been combined and presented under the more inclusive and familiar Curtis type name. Other types have yet to be documented across all of their potential state range, have been

insufficiently studied, or may be so rare that management opportunities in Wisconsin are unclear at this time. The table reflects the following changes from the working list presented by Epstein *et al.* (2000):

- Northern Mesic Forest includes Mesic Cedar Forest and Mesic Floodplain Terrace.
- Northern Wet Forest includes Black Spruce Swamp and Tamarack Swamp.
- Forested Seep is a recently described type that occurs in small patches across parts of the Wisconsin landscape. It is not included in the table but will be mentioned in the descriptions of those Ecological Landscapes where it occurs.
- Tamarack Fen was renamed Southern Tamarack Swamp (formerly tamarack relict, to split tamarack forests that occur south of the Tension Zone from those of the north).
- Sand Prairie includes Sand Barrens.
- Open Bog includes Muskeg and Poor Fen.
- Patterned Peatland was eliminated because it rarely occurs in Wisconsin and represents a complex of several distinct community types.
- All Grassland types that are wet (sedge meadow, wet prairie, calcareous fen) are listed under Wetlands.

Community types that contain potentially important variants, associations, subtypes, and successional stages (e.g., aspen to hemlock-hardwood old growth) will be discussed in the Ecological Landscape chapters.

State Ranks. State ranks were taken from the NHI database to indicate how rare or threatened each community type may be. State ranks are defined in the footnote at the end of the table. State ranks are updated periodically, so users should check Bureau of Endangered Resources information for current community status.

The second part of the table organizes information on the relative abundance of community types both historically and at present. Historical abundance was determined by maps and analyses of vegetation described during the mid-1800's ("pre-EuroAmerican settlement" vegetation). Current abundance was determined primarily from NHI data but other sources were also referenced. Four categories of relative abundance are presented:

- Common historically and still common today.*
- Common historically but uncommon, rare, or severely degraded today.
- Uncommon historically and still uncommon today.
- Geographically restricted, meaning that these natural communities are only found in very specialized places or settings in the state (e.g., along the shores of the Great Lakes).

* Note that even for those types which were common historically and remain relatively common today, some have been reduced in acreage from their former abundance, and most have been altered in some way (composition, structure, or function).

Part 1. Opportunities for Sustaining Wisconsin's Natural Communities by Ecological Landscape^a. See Appendix entitled "Natural Communities" for definitions of <u>Natural Community types</u> . xx = Major Opportunity x = Important Opportunity p = Present blank = Absent See footnotes for definitions of Opportunities, State Ranks, and Inventory Confidence.	State Rank	Superior Coastal Plain*	Northwest Lowlands**	Northwest Sands*	North Central Forest*	Northern Highland*	Northeast Sands**	Northern Lake Michigan Coastal*	Central Lake Michigan Coastal*	Forest Transition*	Western Prairie**	Western Coulee and Ridges*	Southwest Savanna**	Central Sand Plains**	Central Sand Hills*	Southeast Glacial Plains**	Southern Lake Michigan Coastal**
Northern Forest																	
Boreal Forest (spruce-fir)	S2	xx	x		x	p	p	x									
Northern Dry Forest (Jack/red pine, N. pin oak)	S3	x	p	xx	p	x	xx	x						x	p		
Northern Dry-Mesic Forest (white/red pine)	S3	x	x	xx	x	xx	xx	x	x	x	p	x		x	p	p	
Northern Mesic Forest (sugar maple-hemlock-basswood) (includes mesic cedar and floodplain terrace)	S4	x	x	p	xx	x	x	xx	x	xx	p	p		x	p		
Northern Wet-Mesic Forest (white cedar)	S3S4	x	x	x	xx	x	xx	xx	x	xx		p			p	x	p
Northern Wet Forest (black spruce and tamarack)	S4	x	xx	xx	xx	xx	x	x	x	xx	p	x		xx	xx	x	x
Northern Hardwood Swamp (black ash)	S3	x	p	x	xx	x	x	x	x	x		p		x	x	xx	
Southern Forest																	
Southern Dry Forest (white/black oak)	S3										p	xx	x	x	xx	xx	x
Central Sands Pine – Oak Forest (white/red pine/oaks)	S3													xx	xx		
Southern Dry-Mesic Forest (red oak)	S3								x	p	x	xx	x	xx	x	xx	x
Southern Mesic Forest (sugar maple-basswood)	S3							p	x	p	x	xx	x	x	p	x	x
Southern Hardwood Swamp (red maple-green ash-elm)	S2								p			p				x	x
Floodplain Forest (silver maple-river birch-green ash-hackberry-swamp white oak-cottonwood)	S3	x		p	x	p	p	x	x	x	x	xx	p	xx	x	xx	p
White Pine – Red Maple Swamp	S2													xx			
Southern Tamarack Swamp	S2											x		x	x	xx	x
Hemlock Relict	S2											xx	p	p			
Pine Relict	S2											xx	x	p			
Oak Savanna																	
Oak Opening (bur-white-black oaks)	S1										x	xx	xx		p	xx	x
Oak Woodland	S1										x	xx	xx	p	p	xx	p
Cedar Glade	S4							x	p		x	xx	p	p	p	x	
Barrens																	
Pine Barrens (jack pine)	S2			xx		p	xx					x		xx	x		
Oak Barrens (black oak)	S2											xx		xx	x		
Great Lakes Barrens (red/white pine)	S1	xx						p									
Grassland																	
Dry Prairie	S3										x	xx	xx	x	x	xx	

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Grassland continued																	
Sand Prairie (or Dry Sand Prairie; includes sand barrens)	S2										x	xx	p	xx	x	p	
Dry-Mesic Prairie	S2										x	xx	xx	x	p	xx	p
Mesic Prairie	S1										xx	x	xx	p	p	xx	x
Bracken Grassland	S2					x	xx										
Emergent Aquatic	S4	xx	x	xx	xx	xx	x	xx	x	x	xx	xx	p	x	xx	xx	x
Emergent Aquatic-Wild Rice	S3	xx		xx	x	xx	p	p	p	p	p	x		p	p	x	
Submergent Aquatic	S4	xx	x	xx	xx	xx	x	x	x	x	x	xx	p	x	x	x	p
Submergent Aquatic- Oligotrophic marsh	S3			p		xx											
Wetland																	
Open Bog (includes muskeg and poor fen)	S4	xx	xx	xx	xx	xx	x	p	p	x				xx	x		
Bog Relict	S3								p			p			x	xx	x
Alder Thicket	S4	x	x	x	xx	x	x	p	p	x	p	x		xx	x	p	
Shrub Carr	S4	x	p	p	x	x	p	xx	x	x	p	xx	p	xx	xx	xx	x
Ephemeral Pond	SU	p	p	u	xx	x	p	x	x	x	p	x	p		p	x	x
Interdunal Wetland	S1	xx						p	x								
Boreal Rich Fen	S2				x	x	x	xx									
Wet-Mesic Prairie	S2											x	x	p	xx	xx	xx
Wet Prairie	SU										p	x	p	p	x	x	x
Northern Sedge Meadow	S3	x	xx	xx	xx	xx	x	xx	x	x	p	x		xx	x	x	
Southern Sedge Meadow	S3							x	x	p	p	x	p	x	xx	xx	x
Coastal Plain Marsh	S1													x	xx		
Calcareous Fen (Southern)	S3											p		p	xx	xx	x
Great Lakes Coastal Fen	S2	xx						x									
Miscellaneous Communities^b																	
Great Lakes Beach	S2	xx						xx	xx								p
Great Lakes Dune	S2	xx						xx	xx								x
Inland Beach	S3			xx	p	x	p							p			
Forested Ridge and Swale	S2	p						xx	xx								
Great Lakes Alkaline Rockshore	S2							xx									
Great Lakes Bedrock Shore	S2	x															
Bedrock Glade	S3		p		xx	p		p	x	x	x	xx		p	x		
Alkaline Clay Bluff	S2	x						x	x								x
Alvar	S1							p	xx								
Algific Talus Slope	S1											xx					
Dry Cliff (Curtis' Exposed Cliff)	S4	xx	p		xx		x	xx	xx	x	x	xx	x	xx	p	xx	p
Moist Cliff (Curtis' Shaded Cliff)	S4	xx	p		xx		x	x	x	x	x	xx	x	x	x	x	p

^a This table does not suggest that the landscape should be restored to historic conditions. This may not be desirable or even possible because of human needs and changes to the environment (e.g., introduction of invasive species or large deer populations). This table also does not imply that we should continue with status quo management. We need to continue to improve and refine management to meet the needs of both people and diverse sustainable ecosystems.

Definitions:

Major Opportunity – type extensively represented by multiple significant occurrences, or EL is appropriate for major restoration activities.

Important Opportunity – type not extensive or common in EL but represented by 1 to several significant occurrences, or type restricted to 1 or few EL's.

Present – better opportunities exist on other EL's, or opportunities not adequately evaluated.

Absent – type absent, or no occurrences documented.

State Rank

S1= Critically imperiled in Wisconsin because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or some factor(s) making it vulnerable to extirpation.

S2= Imperiled in Wisconsin because of rarity (6 to 20 occurrences or few remaining individuals or acres) or some factor(s) making it very vulnerable to extirpation from the state.

S3= Rare or uncommon in Wisconsin (21 to 100 occurrences).

S4= Apparently secure in Wisconsin, with many occurrences.

S5= Demonstrably secure in Wisconsin and essentially ineradicable under present conditions.

SU= Possibly in peril in the state, but their status is uncertain. More information is needed.

Inventory Confidence

* Indicates that the Ecological Landscape has not been completely inventoried or that additional data are needed and that there is incomplete knowledge of what natural community types exist in the Ecological Landscape.

** Indicates that there are sufficient data or knowledge about the presence of natural community types within an Ecological Landscape.

^b **Miscellaneous Communities** -- soil profile poorly developed or absent (usually bare sand or bedrock) in these communities, except for Forested Ridge and Swale.

Part 2. Relative abundance of natural community types historically and at present.

Common Historically-Still Common

Northern Forest

Northern Dry-Mesic Forest (white/red pine)
Northern Mesic Forest (sugar maple-hemlock-yellow birch-basswood)
Northern Wet-Mesic Forest (white cedar)
Northern Wet Forest (black spruce and tamarack)
Northern Hardwood Swamp (black ash)

Southern Forest

Southern Dry Forest (white/black oak)
Central Sands Pine–Oak Forest (white/red/jack pine/oaks)
Southern Dry-Mesic Forest (red/white oak)
Southern Mesic Forest (sugar maple-basswood)
Southern Hardwood Swamp (red maple-green ash-black ash-elm)
Floodplain Forest (silver maple-river birch-green ash-swamp white oak)

Aquatic Plant Communities

Emergent Aquatic
Submergent Aquatic

Wetland

Open Bog (includes muskeg and poor fen)
Alder Thicket
Shrub Carr
Ephemeral Pond
Northern Sedge Meadow
Southern Sedge Meadow

Common Historically-Now Uncommon or Rare

Northern Forest

Northern Dry Forest (Jack/red pine, Hill's oak)

Oak Savanna

Oak Opening (bur-white-black oaks)
Oak Woodland (similar, structure differs)

Grassland

Dry Prairie
Dry-Mesic Prairie
Mesic Prairie

Barrens

Pine Barrens (jack pine)
Oak Barrens (black oak)

Wetlands

Wet-Mesic Prairie
Wet Prairie

Common Historically-Now Uncommon or Rare (continued)

Aquatic Plant Communities

Emergent Aquatic – Wild Rice

Uncommon Historically-Still Uncommon or Now Rare

Northern Forest

Boreal Forest (spruce-fir)

Southern Forest

Hemlock Relict
Pine Relict
White Pine - Red Maple Swamp
Southern Tamarack Swamp

Oak Savanna

Cedar Glade

Wetlands

Calcareous Fen (Southern)
Bog Relict
Boreal Rich Fen

Grassland

Bracken Grassland
Sand Prairie (includes sand barrens)

Aquatic

Submergent Aquatic- Oligotrophic marsh

Geographically Restricted Types

Great Lakes Shorelines

Great Lakes Beach
Great Lakes Dune
Great Lakes Alkaline Rockshore
Great Lakes Bedrock Shore
Alvar

Wetlands

Interdunal Wetland
Great Lakes Coastal Fen (Shore Fen)

Barrens

Great Lakes Barrens

Wetlands

Coastal Plain Marsh

Miscellaneous Types

Algific Talus Slope
Alkaline Clay Bluff
Bedrock Glade
Dry Cliff (Curtis' Exposed cliff)
Moist Cliff (Curtis' Shaded Cliff)